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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/516,504	12/02/2004	Hiroyuki Mizuguchi	081356-0226	8630

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FOLEY AND LARDNER LLP  
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WASHINGTON, DC 20007

EXAMINER
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MARVICH, MARIA

ART UNIT	PAPER NUMBER
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1633

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/516,504	<b>Applicant(s)</b> MIZUGUCHI ET AL.	
	<b>Examiner</b> MARIA B. MARVICH	<b>Art Unit</b> 1633	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 19 November 2007.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1,2,5-11,13-17 and 19-21 is/are pending in the application.
- 4a) Of the above claim(s) 8-11 and 13-17 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 2,5-7 and 19-21 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

### **DETAILED ACTION**

Claims 1, 2, 5-11, 13-17 and 19-21 are pending in the instant application. Claims 8-11 and 13-18 are withdrawn from further consideration and therefore, claims 1, 2, 5-7 and 19-21 are under examination.

#### ***Response to Amendment***

Applicants' amendments have been persuasive in overcoming the objections as well as the rejections of claims 1-7, 12 and 18-21 under 35 U.S.C. 112, second paragraph. However, upon reconsideration, the following objections are set forth. As well as, rejections under 35 USC 103 to claims previously considered to be free from the art are presented below.

#### ***Claim Objections***

Claims 1, 2 and 7 are objected to because of the following informalities: claim 1 for grammatical clarity should recite --comprising an-- in line 2 as opposed to "comprised of a". In claim 2 for accuracy, the "aforementioned E1 region" would be better if recited as --deleted E1 region--. Claim 7 recites that "a foreign gene is inserted into a site that lacks part or all of the E1 and/or E3 region. However, a gene cannot be inserted into both the E1 and E3 regions. It appears that the claim is intended to recite --a foreign gene is inserted into the deleted E1 or E3 region--. Appropriate correction is required.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 2, 5-7 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bett et al (2004/0106194; see entire document) or Schraa et al (2001/0033833; see entire document).

The instant claims are drawn to an adenovirus type 35 vector wherein the E1 region is deleted. The instant claims limit the deletion to between 367 and 2,917 or 3,375.

Bett et al teach an Ad35 vector comprising a deletion in the E1 region in which the vector is deficient in E1 as well as deletion in the E3 region (see e.g. ¶ 65 and 73-80). A heterologous gene is inserted into the E1 region or the E3 region. The drawings and disclosure teach that the deletion in the E1 region is between 457 and 3402. The purpose of the deletion is to obliterate E1 gene functions. The virus is used to infect target cells.

Schraa et al teach an Ad35 vector comprising a deletion in the E1 region in which the vector is deficient in E1 as well as deletion in the E3 region (see e.g. ¶ 61 and 63). The E1 region is deleted and replaced with a gene of interest (see e.g. ¶ 15). Cells are infected with the virus (see e.g. ¶ 70).

The instant specification teaches "In particular, the term "E1-deleted region" refers to an E1 protein-encoding region that is functionally defective" (page 6). The sequences were chosen with this purpose in mind and do not appear to provide an advantage over similar deletions.

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“Specifically, the adenovirus vector according to the present invention may comprise part of the E1 region of the adenovirus type 35 genome as long as the E1 protein that functions in a host cell is not expressed. The "E1-deleted region" may lack all or part of the Ela or Elb region, may lack all of both regions, or may lack a portion that spans both regions, as long as an E1 protein-encoding region is functionally defective”. Similarly, the E3 region is deleted in the instant claims to abrogate function of the E# genes. Because the Office does not have the facilities for examining and comparing the applicant's product with the products of the prior art, the burden is on the applicant to show a novel or unobvious difference between the claimed products and the products of the prior art (e.g. that the products of the prior art do not possess the same material structural and functional characteristics of the claimed product). See *in re Best*, 562 F.2d 1252, 195 USPQ 430 (CCPA 1977). To this end, the deletions of Bett et al are indistinguishable from that of the instant invention.

As well, KSR forecloses the argument that a specific teaching, suggestion or motivation is required to support a finding of obviousness. See the recent Board decision *Exparte Smith* -- USPD2d--, slip op. at 20, (BD. Pat. App. & Interfer. June 25, 2007). In light of this, it would have been obvious to one of ordinary skill in the art at the time the invention was made that the vector of Betts et al and Schraa et al is indistinguishable from that of the instant claims because Betts and Schraa et al teaches that the ad35 vector is deficient in E1 function. As well, it is within the ordinary skill of the art to use available methodologies to isolate a variety of vectors comprising any of a number of deletions that resulting E1 inactivation. One would have been motivated to do so in order as the ability to modify sequences by applying conventional methodologies. Based upon the teachings of the cited references, the high skill of one of ordinary

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skill in the art, and absent evidence to the contrary, there would have been a reasonable expectation of success to result in the claimed invention.

Claims 1, 2, 5-7 and 19-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bett et al (2004/0106194; see entire document) or Schraa et al (2001/0033833; see entire document) in view of Wadell et al (US 2004/0136958; see entire document).

The instant claims are drawn to an adenovirus type 35 vector wherein the E1 region is deleted. The instant claims limit the deletion to between 367 and 2,917 or 3,375 and wherein the virus is used to infect CD34+.

The teachings of Bett et al and Schraa et al are as above except neither teaches infection of CD34+ cells.

Wadell et al teach that Ad35 has high affinity to CD34+ cells (see e.g. ¶ 134).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to infect the vector of Betts et al and Schraa et al into CD34+ cells as taught by Wadell et al because Betts and Schraa et al teaches develop the ad35 vector as a vector for transduction purposes and because Wadell et al teach that Ad35 has high tropism fro CD34+ cells. One would have been motivated to do substitute known vectors using known methods to provide therapeutic vectors to CD34+ cells. Based upon the teachings of the cited references, the high skill of one of ordinary skill in the art, and absent evidence to the contrary, there would have been a reasonable expectation of success to result in the claimed invention.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MARIA B. MARVICH whose telephone number is (571)272-0774. The examiner can normally be reached on M-F (7:00-4:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Joseph Woitach, PhD can be reached on (571)-272-0739. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Maria B Marvich, PhD  
Examiner  
Art Unit 1633

/Maria B Marvich, PhD/  
Examiner, Art Unit 1633